INTEGRATION OF MULTIPLE HAZARD ANALYSIS REQUIREMENTS AND ACTIVITIES

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Background

- Identify opportunities for integrating hazard analysis requirements
- Identify noteworthy field practices for ensuring consistency of hazard analysis
- Identify methods for streamlining chemical hazard analysis and integrating with other hazard analysis activities

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Background (cont'd)

- Two years of effort has resulted in a DOE Handbook
- Handbook has been reviewed extensively within CSTC and DOE complex
- Handbook published in August 2003
- DOE-HDBK-1163-2003, *Integration of Multiple Hazard Analysis Requirements and Activities*

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Handbook Contents

- Comparison of HA requirements
- Best management practices
- Appendices and references
- Available on DOE Standards Website

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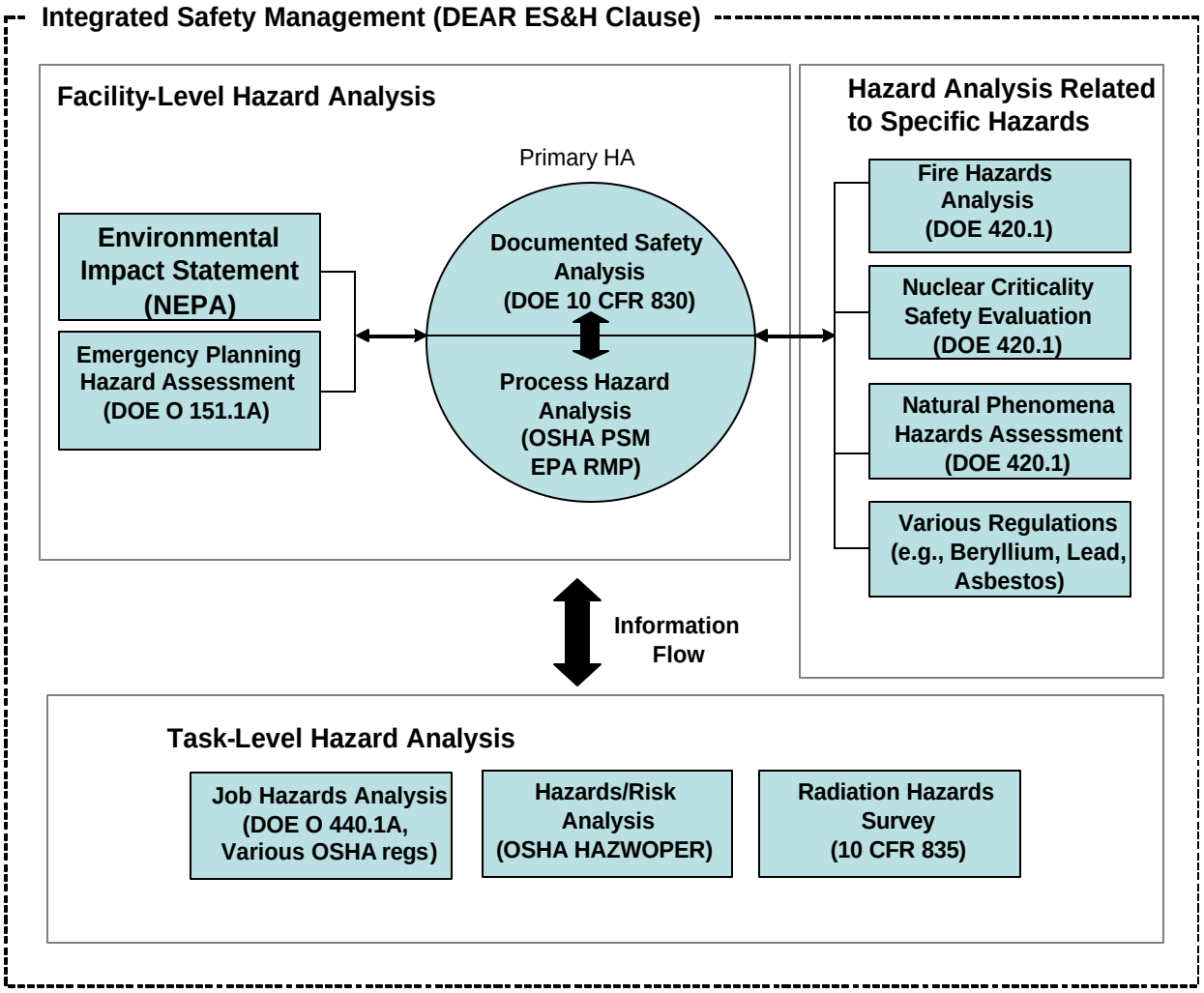
Compared HA Requirements

- Facility level
- Activity-level
- Other HA types

HA Activities



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Facility Requirements

- EPA Chemical Process Hazard Analysis (40 CFR 68, “Chemical Accident Prevention Provisions,”
- OSHA “Process Safety Management”, 29 CFR 1910.119 (1926.64)
- DOE “Nuclear Safety Management”, 10 CFR 830, Subpart B,
- DOE Emergency Preparedness Hazard Assessment, DOE Order 151.1
- EPA Environmental Impact Statements, “Council on Environmental Quality”, 40 CFR Parts 1500-1508, Site Wide
- DOE, “National Environmental Policy Act Implementing Procedures”, 10 CFR 1021, Site wide

Activity Requirements

- OSHA, Worker Hazard and Risk Analysis of Hazardous Waste Cleanup Activities (29 CFR 1910.120 and 1926.55, “Hazardous Waste Operations and Emergency Response”)
- DOE, Job Hazard Analyses, “Worker Protection Management”, DOE Order 440.1A
- DOE, Analysis of Occupational Radiation Hazards, “Occupational Radiation Protection”, 10 CFR 835

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HA for Specific Hazard Types

- Fire Hazards Analysis, DOE Order 420.1
- Nuclear Criticality Safety Evaluation, DOE Order 420.1
- Natural Phenomena Hazards Assessment DOE Order 420.1
- Various Hazard Specific Regulations (e.g., Beryllium Hazards Assessment (10 CFR 850), OSHA regulations for asbestos and lead (29 CFR 1910.1001 and 1910.1025)

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Best Management Practices

- Multi-disciplinary teams
- Collection and integration of hazard information
- Screening of multiple hazard types
- Evaluation of facility hazards and accidents
- Streamlining of activity-level hazard analysis

Multidisciplinary Teams

- HA leader
- Fire Protection
- Industrial Hygiene
- Radiological Control
- Industrial Safety
- Medical Surveillance
- Nuclear Criticality
- Environmental
- Process or design engineering
- The WORKER

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Collect and Integrate Hazard Information

- Process Technology Data
- Hazardous Material Data
- Facility, Equipment, Process Design Data
- Other or similar HA reports: JHA, FHA, EIS, NCS, PrHA, etc.

Screening of Hazards

- Identify hazards not requiring formal analysis
- Hazards are well understood
- Hazards have adequate safety guidance
- Hazards controlled by OSHA or consensus standards

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Screening Examples

Radioactive material	Any radioisotope meeting or exceeding the Table A1, DOE-STD-1027-92 TQ criteria; or exceeding the Appendix B, 40 CFR 302 RQ criteria.
Toxic material (including combustion products)	Any toxic chemical or combustion products or any other known toxic material (e.g., NIOSH Pocket Guide to Chemical Hazard lists an IDLH)
Asphyxiant	Any asphyxiant that could affect workers
Flammable Material	> 5000lb. of a liquid with a flash point < 100^{o} F or > 3000 standard ft^3 of a gas with an established lower explosive limit (LEL)
Reactive Material	> 10 lb of a substance with an NFPA reactivity hazard level $\geq$ 2
Electrical Energy	Unusual application not adequately controlled by OSHA (e.g., soil vitrification); $\geq$ 800 volts and 24 ma output; or stored energy $\geq$ 50 joules at 600 volts
Kinetic Energy	High energy (e.g., flywheel or centrifuge-type equipment)
High Pressure	3,000 psig or 0.1 lb TNT (1.4×10^5 ft-lb_f) equivalent energy

Evaluation of Hazards and Accidents

- Integrate at facility level
- Integrate among safety disciplines in within HA
- Standardize HA methods and tools at the site
- Review other analyses to ensure consistent assumptions and inputs

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Streamline Activity HA

- Integrate activity HA within work planning process
- Institutionalize this practice in procedures
- Include all hazards and disciplines
- Consider automated tools (AJHA)

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Conclusion

- Foundation of HA integration is communication
- Integration of facility and activity-level HA ensures optimal selection of hazard controls
- Integration can increase efficiency and save money

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